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ABSTRACT

A project was begun in 1973 in the Indianapolis Public School system based on the hypothesis that English language skills and the control of syntactic structures can be measurably improved through participation in a specially designed Latin FLES program stressing the importance of Latin root words. Goals of the project were to assess whether or not the study of Latin and classical civilization will: (1) expand the verbal functioning of sixth grade children in English, and (2) broaden their cultural horizons and stimulate an interest in humanities. The project was directed towards approximately 400 sixth graders in six schools, all studying Latin and classical civilization in a program coordinated with their regular classes. They received a thirty-minute lesson each day 5 days per week taught by a Latin specialist. The present program evaluation report shows overall gains in word knowledge, reading, language, spelling, math computation, math concepts, math problem solving, and social studies after the first year, and gains in spelling, reading, and math concepts following the second and third years of the program, as seen from results on subtests of the Metropolitan Achievement Test. Teachers' evaluation of the program were generally favorable. (CLK)

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AUGMENTING READING SKILLS THROUGH LANGUAGE LEARNING TRANSFER

FLES Latin Program Evaluation Reports, 1973-74, 1974-75, 1975-76.

Rita Sheridan

Indianapolis Public Schools
Title III Project

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AUGMENTING READING SKILLS THROUGH LANGUAGE LEARNING TRANSFER

In the summer of 1973, the Indianapolis Public Schools received a Title III grant of $32,250.00 to develop a project which is predicated on the hypothesis that significant English language skills and the control of syntactic structures can be measurably improved through participation in a specially designed Latin FLES program which stresses the importance of Latin root words. The general goals of this project are to assess whether or not the study of Latin and classical civilization will:

1. expand the verbal functioning of sixth grade children in English
2. broaden their cultural horizons and stimulate an interest in humanities.

The project is directed toward approximately 400 sixth grade students in six schools. Two additional schools with approximately 100 sixth grade students were selected to function as control groups. All participating students are studying Latin and classical civilization in a program coordinated with their work in their regular classes. There is a thirty-minute lesson each day five days per week taught by a Latin specialist. The complete battery (Form H) of the intermediate Metropolitan Achievement Test was used as a pretest in October, 1973 and (Form F) was used as a post test in March, 1974.

At the end of the first year of this three year project, the experimental group has shown within a 5 month period between the pretest and post test a gain on the following subtests of the intermediate battery of the Metropolitan Test as follows: 8 months on Word Knowledge, 1 year in Reading, 1 year and 1 month in Language, 4 months in Spelling, 7 months in Math Computation, 8 months in Math Concepts, 9 months in Math Problem Solving, 5 months in Science and 7 months in Social Studies.

C. EVALUATION REPORT

The second year of our effort to augment reading skills through language learning transfer has proven to be as successful as the first year. The success in the cognitive domain is very evident. The pre and post tests' results are reported in this section. Internal evaluation was also constant throughout the year. The materials used were polished and augmented. One teacher-specialist resigned for personal reasons at mid-semester and she was replaced. The new teacher adjusted slowly at first, but by mid-semester had taken hold.

The questionnaire used in assessing the affective domain was completely inadequate. The terminology was too difficult and the results were unreliable, thus they will not be alluded to in this evaluation.

The original number of students in the experimental group for pretesting was 469 and in the control group, 107. The post test revealed that the groups were reduced to 339 and 93 respectively. It is felt that this decrease in numbers caused by mobility of students does not affect the statistics and continues to supply a population significantly large enough to yield statistically significant data.

The pretest revealed that the control group and the experimental group were quite reasonably well matched on Form H of the Metropolitan Achievement Tests. The groups were selected on the basis of their similarity of economic, social and academic profiles.

The three following charts show: Chart 1, a comparison of the experimental and control groups on the pretest; Chart 2, a comparison of the experimental

and control groups on the post test; Chart 3, a comparison of the gains made by the experimental group during the six month period with the gains made by the control group during the same six months. In each comparison chart the means were compared also by the T value, which shows if the gain or difference is statistically significant. To interpret the value of T, the following information should be considered. If T is greater than 1.65, then the difference of the means is significant at the 10% level of confidence. This then means that this difference or gain could have occurred only 10 times out of 100 by chance alone. Statistically, some other causative factor affected the other 90%. If T is greater than 1.96, then the difference of the means is significant at the 5% level of confidence. If T is greater than 2.58, then the difference of the means is significant at the 1% level of confidence.

In Chart 1, comparing the experimental group with the control group on the pretest, the difference in Spelling and Math Concepts was significant at the 1% level of confidence in favor of the experimental group. In Reading the mean scores were very close to being statistically different at the 10% level of confidence in favor of the control group. In all other subtests there was no significant difference.

CHART 1. PRETEST

	EXPERIMENTAL GROUP				CONTROL GROUP		
	Mean G. E.	St. Dev.	No.	T value	Mean G. E.	St. Dev.	No.
Word Knowledge	4.3	1.29	328	.71	4.4	1.17	93
Reading	4.0	1.42	328	1.61	4.3	1.27	93
Language	3.9	.89	334	1.02	4.0	.81	93
Spelling	5.3	1.45	329	3.73	5.0	1.47	91
Math Computation	5.1	1.00	320	.97	5.0	.83	93
Math Concepts	4.6	1.12	317	2.94	4.2	1.15	91
Math Problem Solving	4.5	1.25	318	.68	4.4	1.23	91
Science	4.2	1.18	337	.69	4.1	1.25	93
Social Studies	4.1	1.7	339	.76	4.2	1.13	93

In Chart 2, comparing the experimental group with the control group on the post test, the mean difference in Word Knowledge, Math Problem Solving and Science was significant at the 5% level of confidence in favor of the experimental group. In Math Computation and Math Concepts the difference was highly significant in favor of the experimental group. In Reading, Language and Social Studies the gains were significant at the 12%--19% level of confidence.

CHART 2. POST TEST

	EXPERIMENTAL GROUP				CONTROL GROUP		
	Mean G.E.	St. Dev.	No.	T value	Mean G.E.	St. Dev.	No.
Word Knowledge	5.1	1.42	328	1.97	4.8	1.26	93
Reading	5.0	1.36	328	1.30	4.8	1.30	93
Language	5.6	1.62	334	1.55	5.3	1.65	93
Spelling	5.6	1.47	329	1.23	5.5	1.46	91
Math Computation	6.0	1.22	320	4.09	5.5	.98	93
Math Concepts	5.4	1.53	317	3.72	4.8	1.30	91
Math Problem Solving	5.2	1.30	318	2.10	4.9	1.17	91
Science	4.8	1.31	337	2.16	4.5	1.15	93
Soc. Studies	4.9	1.32	339	1.55	4.7	1.03	93

In Chart 3, comparing the mean gain of the experimental group with the mean gain of the control group, it is obvious that the experimental group's gain was extremely significant. The control group made significant gains, but in comparing the T values the gains of the experimental group far exceeded those of the control group.

CHART 3.

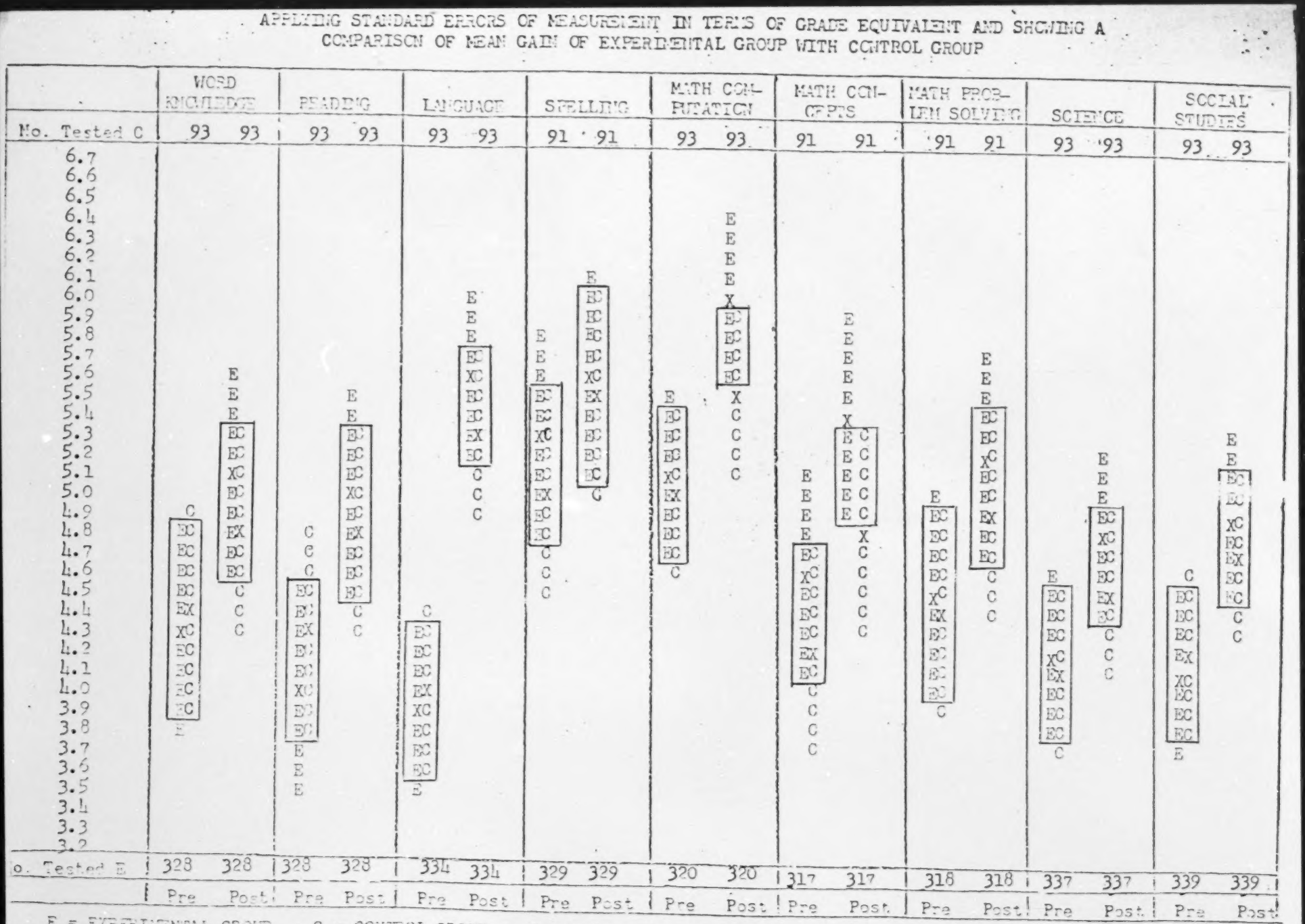
GAINS OF EXPERIMENTAL GROUP OVER CONTROL GROUP

(T values indicating Gain from Pre to Post Test)

	EXPERIMENTAL GROUP		CONTROL GROUP	
	Mean Gain	T value	Mean Gain	T value
Word Knowledge	.8	7.55	.4	2.24
Reading	1.0	9.21	.5	2.65
Language	1.7	16.81	1.3	6.82
Spelling	.3	3.69	.5	2.30
Math Computation	.9	10.20	.5	3.75
Math Concepts	.8	7.51	.6	3.29
Math Problem Solving	.7	6.92	.5	2.80
Science	.6	6.25	.4	2.27
Social Studies	.8	8.67	.5	3.15

The following table graphically illustrates the comparison of the experimental group with the control group, when the standard error of measurement determined for the Metropolitan Achievement Test is applied.

APPLYING STANDARD ERRORS OF MEASUREMENT IN TERMS OF GRADE EQUIVALENT AND SHOWING A COMPARISON OF MEAN GAIN OF EXPERIMENTAL GROUP WITH CONTROL GROUP



E = EXPERIMENTAL GROUP C = CONTROL GROUP X = MEAN EC = OVERLAP

During the 1973-1974 project year, a special fifth grade class was included in the program, but for only fifteen minutes per day instead of thirty. This same class was included in the thirty minute instruction period this year, 1974-1975. All statistics on this class, with two years of exposure to the program, were kept separate from the experimental and control groups. They are referred to as the Special E group. They were pretested and post tested in 1974-1975 with the same instruments used for the other groups. The following chart indicates their mean scores on the post test of the Metropolitan Achievement Test and compares them with the experimental group and control group.

These children are from the same socio-economic background, but were hand-picked in the fourth grade and given special attention in all phases of their instruction. It is obvious that their gains were great. In 1973-1974, they were tested only on the Word Knowledge Section. Their post test mean score was 5.2 in March, 1974. Their pretest mean score on Word Knowledge in October, 1974 was 5.6. This year, 1974-1975, their post test mean score was 6.6 in Word Knowledge. Many variables were included in all phases of their instruction, thus the credit for their gains would be difficult to establish.

GROUP	WORD KNOW-LEDGE	READING	LANG-UAGE	SPELLING	MATH COMPU-TATION	MATH CON-CEPTS	MATH PROBLEM SOLVING	SCIENCE	SOCIAL STUDIES
	MEAN G.E.	MEAN G.E.	MEAN G.E.	MEAN G.E.	MEAN G.E.	MEAN G.E.	MEAN G.E.	MEAN G.E.	MEAN G.E.
E. Special Group	6.6	6.4	7.7	6.9	7.5	7.8	6.9	6.5	5.3
E. Group	5.1	5.0	5.6	5.6	6.0	5.3	5.1	4.8	4.9
C. Group	4.8	4.8	5.3	5.5	5.5	4.8	4.9	4.5	4.7

E. Special Group -- Sixth grade class that had the program in 1973-1974 and 1974-1975 (School E)

E. Group -- Experimental Group

C. Group -- Control Group

TEACHER EVALUATIONS

The purposes of this experimental project are so closely interrelated to the purposes of the regular classroom instruction that we hoped there would be considerable transfer of vocabulary and concepts from Latin class to the regular classroom curriculum.

Some of the classroom teachers remained with their classes throughout Latin class and so were able to note what vocabulary and cultural concepts their students were learning. Other classroom teachers did not remain in the room and so were very limited in the amount of transfer possible. The attitudes of the classroom teachers greatly affect the attitudes of the students and consequently the success of the program.

Teachers were given an opportunity to assess vocabulary transfer from Latin to other subject areas; to note questions about Latin class materials in their classes; and so on.

Teachers were also given the opportunity of writing comments, favorable or otherwise. We believe that the regular classroom teacher can best observe and measure attitude changes by the behavior they witness in their students during the entire school day and year.

Here are some comments we received in this way:

1. "Pupils have been enthusiastic about their study of Latin. They have also shown more interest in the study of other cultures in Social Studies. There is an excellent reading correlation. In general, the pupils seem more tolerant of practices which differ from their own now."
2. "Latin has made my students more word conscious."
3. "They are more aware of how our language is influenced by others. This makes them more aware of other cultures besides ours and helps them understand how it is possible to communicate in some other language."

4. "The boys and girls seem to have an interest towards other languages as well."

5. "I have never seen any subject matter to hold the interest of my students for an entire school year as this Latin class did."

6. "The kids are beginning to ask intelligent questions about a number of things. For example, a class period spent on Roman government in Social Studies grew into a good discussion on the government of the United States."

7. "If anything, their attitudes are getting worse. They fail to see the relationship to Latin and English and thus are bored and in general disinterested in the course."

8. "I wish there would be a follow-up for the students in seventh grade."

9. "Latin captured their imagination, but they don't know how to use it yet. It intrigues them."

10. "As far as attitudes, the children seem to enjoy calling each other by their Latin names. They seem proud of their Latin names."

11. "They are excited about Latin class daily. They have been equally excited about our study of Japan in Social Studies."

12. "Latin has brought a foreign culture into my room in a way I could not attempt through our social science testbook."

13. "What an exciting way by which to teach children vocabulary! I am sure for most of my students that the vocabulary words learned through Latin will be remembered longer than most others."

14. "Latin was a positive and enjoyable experience for my students. Methodology of teaching was most innovative and lively! But yet probably the most basic skill was at the core of the course--teaching our kids how to read better by increasing their vocabulary."

A criterion referenced vocabulary test consisting of 30 multiple choice items was administered to all students in control and experimental schools as a pre and post test. The following graphs summarize student performance on the test.

VOCABULARY TEST

Pretest, Experimental Schools

Number Correct

30
29 -- 1%
28
27 -- 1%
26 ---- 2%
25 ---- 2%
24 ------ 3.75%
23 ------ 3.75%
22 ---------- 5%
21 ---------- 5%
20 ------------------ 9%
19 ---------------- 7%
18 ------------------ 9%
17 ---------------- 8%
16 ---------------- 7%
15 ------------------ 9%
14 ---------------- 7%
13 ------ 3.75%
12 ---------- 5%
11 ------ 3.75%
10 ---- 2%
9 -- 1%
8 -- 1%
7 -- 1%
6 -- 1%
5 -- 1%
4 -- 1%
3
2
1
0 Percentage of Students

Post test, Experimental Schools

Number Correct

30 ------------------------ 18%
29 ---------------- 15.25%
28 ---------------- 15.25%
27 ---------------- 9%
26 ------------------ 10%
25 ------------ 7%
24 ------------ 6%
23 ---------- 5%
22 ---------- 4%
21 ---------- 3%
20 ---------- 3%
19 --------- 2%
18 -- 0.3%
17 ---- 1%
16
15
14 -- 0.3%
13 -- 0.3%
12
11 -- 0.3%
10 -- 0.3%
9
8
7
6
5
4
3
2
1
0 Percentage of Students

The following significant facts are shown by the above graphs:

1. 10% of the students in the experimental schools scored 80% or above on the pretest.

2. 80% of the students in the experimental schools scored 80% or above on the post test.

3. 70% of the students in the experimental schools advanced to a mastery level of 80% or above.

VOCABULARY TEST

Pretest, Control Schools

Number Correct

30
29
28 -- 1%
27 -- 1%
26 ----2%
25 -------- 4%
24 -------- 4%
23 ---------- 5%
22 ---------- 7.5%
21 ---------- 7.5%
20 ---------- 6%
19 ---------- 6%
18 ---------- 12%
17 ---------- 6%
16 ---------- 7%
15 ---------- 9%
14 -------- 4%
13 ------ 3%
12 -------- 4%
11 ---- 2%
10 ---- 2%
9 ---- 2%
8 ---- 2%
7 -- 1%
6 -- 1%
5
4 -- 1%
3
2
1
0

Percentage of Students

Post Test, Control Schools

Number Correct

30
29 ------3%
28 ---- 2%
27 -- 1%
26 ---- 2%
25 ---- 2%
24 -------- 4%
23 ---------- 7%
22 ---------- 5%
21 ---------- 13%
20 ---------- 11%
19 ---------- 11%
18 ---------- 7%
17 ---------- 9%
16 ---- 2%
15 ---------- 5%
14 ---- 2%
13 -------- 4%
12 ---- 2%
11
10
9
8
7 -- 1%
6
5 ------ 3%
4 -- 1%
3
2
1
0

Percentage of Students

The following significant facts are shown by the above graphs:

1. 12% of the students in the control schools scored 80% or above on the pretest.

2. 11% of the students in the control schools scored 80% or above on the post test.

3. 2% of the students in the control schools advanced to a mastery level of 80% or above.

Sixth grade class (28 students) that had the program in 1973-1974 and 1974-1975 (School E)

VOCABULARY TEST

Pretest, October, 1974

Number Correct	Percentage of Students
30	
29	7%
28	14%
27	11%
26	3.75%
25	14%
24	11%
23	14%
22	3.75%
21	7%
20	3.75%
19	7%
18	
17	
16	
15	
14	
13	3.75%
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	
0	

Post Test, April, 1975

Number Correct	Percentage of Students
30	32%
29	21%
28	25%
27	3.75%
26	7%
25	3.75%
24	
23	3.75%
22	
21	3.75%
20	
19	
18	
17	
16	
15	
14	
13	
12	
11	
10	
9	
8	
7	
6	
5	
4	
3	
2	
1	
0	

C. EVALUATION REPORT

The third year of our effort to augment reading skills through language learning transfer has proven to be as successful as the first two years. The success in the cognitive domain is very evident. The pre and post tests' results are reported in this section. Internal evaluation was also constant throughout the year. The materials used were teacher-made or adapted and printed in booklet form. The two teacher-specialists were the same as last year. The schools used were also the same for the experimental group.

The original number of students in the experimental group for pretesting was 468 and in the control group, 144. The post test revealed that the groups were reduced to 248 and 111 respectively. It is felt that this decrease in numbers caused by mobility of students does not affect the statistics and continues to supply a population significantly large enough to yield statistically significant data. One school's program was shortened to three to four days per week and their scores were pulled out of all statistics to maintain their purity.

The pretest revealed that the control group and the experimental group were quite reasonably well matched on Form H of the Metropolitan Achievement Tests. The groups were selected on the basis of their similarity of economic, social and academic profiles.

The three following charts show: Chart 1, a comparison of the experimental and control groups on the pretest; Chart 2, a comparison of the experimental and control groups on the post test; Chart 3, a comparison of the gains made by the experimental group during the six month period with the gains made by the control group during the same six months. In the first two charts the

means were compared also by the T value, which shows if the difference is statistically significant. To interpret the value of T, the following information should be considered. If T is greater than 1.65, then the difference of the means is significant at the 10% level of confidence. This then means that this difference or gain could have occurred only 10 times out of 100 by chance alone. Statistically, some other causative factor affected the other 90%. If T is greater than 1.96, then the difference of the means is significant at the 5% level of confidence. If T is greater than 2.58, then the difference of the means is significant at the 1% level of confidence.

In Chart 1, comparing the experimental group with the control group on the pretest, the difference in Spelling was significant at the 1% level of confidence in favor of the control group. In all other subtests there was no significant difference.

CHART 1. PRETEST

	EXPERIMENTAL GROUP					CONTROL GROUP			
	Median G.E.	Mean G.E.	St. Dev.	No.	T value	Median G.E.	Mean G.E.	St. Dev	No.
Word Knowledge	4.2	4.4	1.443	248	0	4.1	4.4	1.244	108
Reading	4.1	4.2	1.558	248	.57	3.8	4.1	1.488	108
Language	3.7	4.2	1.516	247	.59	4.3	4.3	1.474	110
Spelling	5.0	5.1	1.496	247	3.85	5.6	5.7	1.290	109
Math Computation	4.9	5.0	1.166	247	1.56	5.0	5.2	1.102	111
Math Concepts	4.2	4.5	1.347	248	.65	4.4	4.6	1.324	107
Math Problem Solving	3.9	4.2	1.300	248	1.26	4.1	4.4	1.389	105

In Chart 2, comparing the experimental group with the control group on the post test, the mean difference in all areas except Spelling was significant at either the 5% or 10% level of confidence in favor of the experimental group. In Spelling, the experimental group surpassed the control group by 5 months in spite of the fact that the pretest indicated that the control group surpassed the experimental group by 6 months.

CHART 2. POST TEST

	EXPERIMENTAL GROUP					CONTROL GROUP			
	Median G.E.	Mean G.E.	St. Dev.	No.	T value	Median G.E.	Mean G.E.	St. Dev.	No.
Word Knowledge	5.2	5.3	1.829	248	2.09	4.5	4.9	1.581	108
Reading	4.9	4.9	1.664	248	1.69	4.4	4.6	1.476	108
Language	5.4	5.7	1.820	247	2.63	5.0	5.2	1.580	110
Spelling	5.4	5.5	1.518	247	1.25	5.1	5.3	1.331	109
Math Computation	6.0	6.1	1.414	247	2.03	5.7	5.8	1.240	111
Math Concepts	4.9	5.4	1.748	248	2.15	4.6	5.0	1.543	107
Math Problem Solving	5.1	5.2	1.522	248	1.82	4.9	4.9	1.365	105

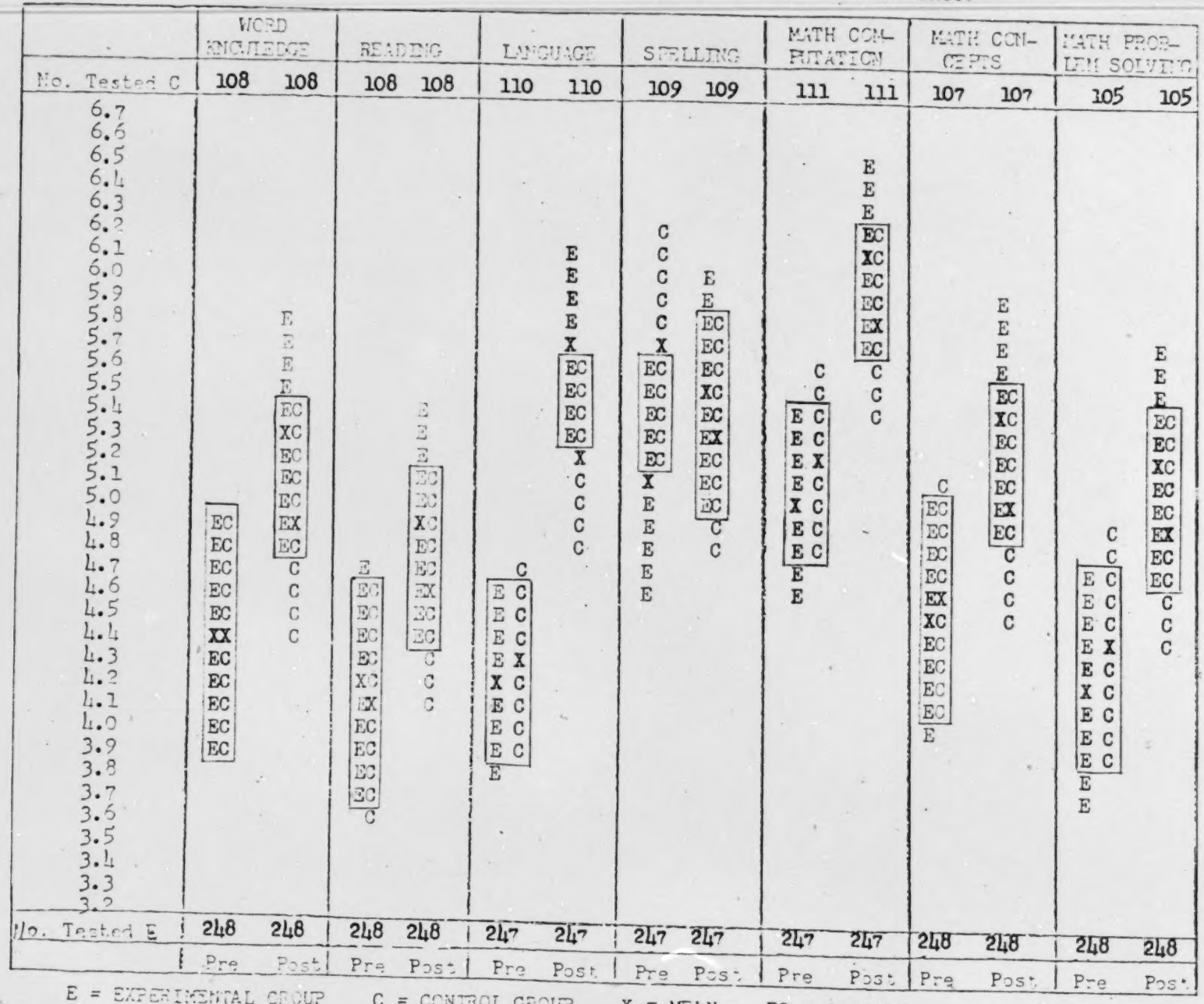
In Chart 3, comparing the mean gain of the experimental group with the mean gain of the control group, it is obvious that the experimental group's gain was quite significant. A comparison of the gains made on the median score by the experimental group indicates in some instances even greater progress by the experimental group over the control group.

CHART 3. GAINS FROM PRE TO POST TEST OF EXPERIMENTAL GROUP OVER CONTROL GROUP

	Exp. Mean Gain	Control Mean Gain	Difference of Mean Gains in Favor of the Exp. Group
Word Knowledge	0.9	0.5	0.4
Reading	0.7	0.5	0.2
Language	1.5	0.9	0.6
Spelling	0.4	-0.4	0.8
Math Computation	1.1	0.6	0.5
Math Concepts	0.9	0.4	0.5
Math Problem Solving	1.0	0.5	0.5
	Median Gain	**Median Gain**	**Difference of Median Gains in Favor of the Exp. Group**
Word Knowledge	1.0	0.4	0.6
Reading	0.8	0.6	0.2
Language	1.7	0.7	1.0
Spelling	0.4	-0.5	0.9
Math Computation	1.1	0.7	0.4
Math Concepts	0.7	0.2	0.5
Math Problem Solving	1.2	0.8	0.4

The following table graphically illustrates the comparison of the experimental group with the control group, when the standard error of measurement determined for the Metropolitan Achievement Test is applied.

APPLYING STANDARD ERRORS OF MEASUREMENT IN TERMS OF GRADE EQUIVALENT AND SHOWING A COMPARISON OF MEAN GAIN OF EXPERIMENTAL GROUP WITH CONTROL GROUP



E = EXPERIMENTAL GROUP C = CONTROL GROUP X = MEAN EC = OVERLAP

TEACHER EVALUATIONS

The purposes of this experimental project are so closely interrelated to the purposes of the regular classroom instruction that we hoped there would be considerable transfer of vocabulary and concepts from Latin class to the regular classroom curriculum.

All but three of the classroom teachers remained with their classes throughout Latin class and so were able to note what vocabulary and cultural concepts their students were learning. Other classroom teachers did remain in the room. The attitudes of the classroom teachers greatly affect the attitudes of the students and consequently the success of the program.

Teachers were given an opportunity to assess vocabulary transfer from Latin to other subject areas; to note questions about Latin class materials in their classes; and so on.

Teachers were also given the opportunity of writing comments, favorable or otherwise. We believe that the regular classroom teacher can best observe and measure attitude changes by the behavior they witness in their students during the entire school day and year.

Here are some comments we received in this way:

1. "It relates to them today."
2. "When watching a TV show or film on another culture, they'll ask what we got from them."
3. "They are very excited and hate to miss class."
4. "More interest - more understanding of others."
5. "Some students wanted to learn German because they wanted to learn as many languages as possible. Learning Latin had a positive effect on their desire to learn German."

6. "Latin has given many students an incentive to study other languages."

7. "Very interested in different life styles."

8. "Aware of differences - English is not the only language."

9. "The students' spelling is much improved and their reading is improved by their ability to attack words in context through their familiarity with Latin derivatives. They are quite interested in mythology and are especially aware of examples of Roman influence in architecture in city buildings. Their greetings, expressions of approval, and simple yes or no answers are almost as frequently in Latin as in English. These things apply, though, almost solely to the more apt pupils. The slower students are interested in the classes as they are in progress, but they do not seem to have acquired the quality of transference that has been demonstrated by the former."

10. "I do not think the lack of transfer in writing reflects on the Latin classes. There is a lack of transfer in my students' writing in English and spelling and all subjects. I wish I knew how to achieve transfer to their writing!"

11. "Latin has helped tremendously in Language Arts."

12. "Latin has helped to make my students more word conscious."

13. "Latin is a good basis for building vocabulary."

A criterion referenced vocabulary test consisting of 30 multiple choice items was administered to all students in control and experimental schools as a pre and post test. The following graphs summarize student performance on the test.

VOCABULARY TEST

Pretest, Experimental Schools

Number Correct
30 ** 0.85%
29 *** 1.28%
28 ****** 2.56%
27 **** 1.71%
26 ****** 2.56%
25 ****** 2.56%
24 ******** 3.42%
23 ***************** 7.69%
22 ************** 5.98%
21 ***************** 7.26%
20 ************ 5.13%
19 ********************** 9.83%
18 ********* 3.85%
17 ********************** 9.40%
16 ********* 3.85%
15 ******************** 8.12%
14 ************** 5.98%
13 ********** 4.27%
12 ********** 4.27%
11 ****** 2.56%
10 *** 1.28%
9 ****** 2.56%
8 ** 0.85%
7
6 *** 1.28%
5
4
3
2
1
0 ** 0.85%

Post test, Experimental Schools

Number Correct
30 ********************** 17.95%
29 ******************** 15.81%
28 ****************** 14.10%
27 **************** 12.39%
26 ********* 6.84%
25 ************ 9.83%
24 ****** 4.27%
23 ***** 3.85%
22 **** 2.99%
21 *** 2.56%
20 ** 1.28%
19 ** 1.28%
18 ** 1.28%
17 ** 1.28%
16 ** 1.28%
15 ** 1.28%
14 * 0.43%
13
12
11
10 * 0.43%
9 * 0.85%

The following significant facts are shown by the above graphs:

1. 14.94% of the students in the experimental schools scored 80% or above on the pretest.

2. 81.19% of the students in the experimental schools scored 80% or above on the post test.

3. 66.25% of the students in the experimental schools <u>advanced</u> to a mastery level of 80% or above.

VOCABULARY TEST

Pretest, Control Schools

Number Correct

30
29
28 ** 0.74%
27 ***** 2.22%
26 *** 1.48%
25 ********* 3.70%
24 ******* 2.96%
23 ********* 3.7%
22 ********** 4.44%
21 ********************** 9.63%
20 ************* 5.93%
19 ************************ 10.37%
18 ******************** 8.89%
17 ***************** 7.41%
16 ************************ 10.37%
15 ********* 3.70%
14 *************** 6.67%
13 ** 0.74%
12 ***** 2.22%
11 ******* 2.96%
10 ********* 3.7%
9 ******* 2.96%
8 *** 1.48%
7 ** 0.74%
6 ***** 2.22%
5
4
3 ** 0.74%

Post Test, Control Schools

Number Correct

30
29 *** 1.64%
28 ** 0.82%
27 ** 0.82%
26 ***** 2.46%
25 ******** 4.1%
24 ********** 4.92%
23 ******** 4.1%
22 ************ 6.56%
21 ************** 7.38%
20 ************************** 12.3%
19 ***************** 8.2%
18 ****** 3.28%
17 ************** 7.38
16 ******** 4.1%
15 ******** 4.1%
14 ********** 4.92%
13 ********** 4.92%
12 ****** 3.28%
11 *********** 5.74%
10 ********** 4.92%
9 ** 0.82%
8 ** 0.82%
7 *** 1.64%
6 ** 0.82%

The following significant facts are shown by the above graphs:

1. 11.1% of the students in the control schools scored 80% or above on the pretest.

2. 14.76% of the students in the control schools scored 80% or above on the post test.

3. 3.66% of the students in the control schools advanced to a mastery level of 80% or above.